CHAPTER 4

LESSON OUTLINES FOR THE 50,000-POUND ROUGH-TERRAIN CONTAINER HANDLER

LESSON TITLE: **VEHICLE FAMILIARIZATION**

TASK NUMBER: **551-726-1506 (Perform Starting Procedures On Rough-Terrain Container Handler)**

A. TRAINING OBJECTIVE.

TASK: Be familiar with the characteristics and identify the major components and control and instruments of the 50,000-pound Rough-Terrain Container Handler.
NOTE: Show Transparency 4-1 (Objective).

CONDITION: Given check-on-learning questions with class notes.

STANDARD: To receive a "GO" for this lesson unit, the student will correctly answer all the check-on-learning questions.

B. INTERMEDIATE TRAINING.

Intermediate Training Objective 1

TASK: After this lesson unit, the student will be able to identify the characteristics of the 50,000-pound RTCH.

CONDITION: Given TM 10-3930-641-10, the student will learn the purpose and capabilities and features of the equipment and identify the components of the RTCH.

STANDARD: To receive a "GO" for this lesson unit, the student will correctly answer all the check-on-learning questions.

Intermediate Training Objective 2

TASK: After this lesson unit, the student will be able to identify the major components of the 50,000-pound RTCH.

CONDITION: Given TM 10-3930-641-10 and check-on-learning questions.

STANDARD: To receive a "GO" for this lesson unit, the student will correctly answer all the check-on-learning questions.

Intermediate Training Objective 3

TASK:	After this lesson unit, the student will be able to identify the controls and instruments of the 50,000-pound RTCH.
CONDITION:	Given check-on-learning questions, class notes, and TM 10-3930-641-10.
STANDARD:	To receive a "GO" for this lesson unit, the student will correctly answer all check-on-learning questions.

C. ADMINISTRATIVE INSTRUCTIONS.

1. Training time: As scheduled.

2. Training location: Scheduled classroom.

3. Training type: Conference and practical exercise.

4. Students: Scheduled personnel.

5. Principal and assistant instructors required: One primary instructor for the class and one assistant instructor for every 20 students for the practical exercise.

6. Training aids and equipment: Overhead projector, projection screen, transparencies, and TM 10-3930-641-10 (1 per student).

7. References: STP 55-88H1-SM and TM 10-3930-641-10.

NOTE: Before class arrival, ensure that each student desk or table has a TM 10-3930-641-10 and STP 55-88H1-SM.

D. SEQUENCE OF ACTIVITY.

1. **INTRODUCTION.**

   a. Interest device.

   b. Tie-in.

   c. Lesson Objective (paragraph A).

d. Procedures.

(1) Explanation.

(2) Practical exercise.

(3) Summary**.**

2. **EXPLANATION AND DEMONSTRATION.** Demonstrate the controls and instruments of the 50,000-pound RTCH.

a. Familiarization of Characteristics.

Transparency 4-2

(1) Equipment purpose.

Transparency 4-3

(2) Handles ISO designation 1A or 1C cargo containers or sealand containers.

Transparency 4-4

(3) Handles and stacks containers (two high).

Transparency 4-5

(4) Loads and unloads flatbed trailers and railcars.

Transparency 4-6

(5) Makes over-the-shore landings.

Transparency 4-7

(6) Capabilities and features.

Transparency 4-8

(7) Operates over rough terrain including beaches, snow, mud, and cross country.

Transparency 4-9

(8) Fords up to 60 inches (5 feet) of salt water.

Transparency 4-10

(9) Comes with a 20-foot tophandler and may also have a 35-foot or 40-foot tophandler.

Transparency 4-11

(10) Raises, lowers, tilts forward or backwards, side shifts, or side tilts a container load.

Transparency 4-12

(11) Lifts a container from 12 inches (30 cm) below ground level to 118 inches (300 cm) above ground level (measured from ground to bottom of container).

Transparency 4-13

(12) Articulates for easy load handling (bends in center).

Transparency 4-14

(13) The RTCH can lift up to 50,000 pounds.

Transparency 4-15

(14) The RTCH is built by the Caterpillar Tractor Company. The Army purchased the RTCH in 1984 for $159,138 per RTCH.

Transparency 4-16

(15) Introduction to components.

Transparency 4-17

(16) This shows the RTCH with a 20-foot tophandler/container.

Transparency 4-18

(17) This is the access ladder to the cab. The ladder is on the left side mounted to the fuel tank. The tank holds 165 gallons (10 hours of operating time).

Transparency 4-19

(18) The ladder on the right is mounted to the hydraulic tank. The site gauge is used to check the hydraulic fluid.

Transparency 4-20

(19) There is only one door located on the left-hand side of the cab.

Transparency 4-21

(20) This shows the three compartments of the catwalk.

Transparency 4-22

(21) This is the transmission dipstick and filler tube.

Transparency 4-23

(22) This shows the implementation of the oil filter and some of the hydraulic lines of the vehicle.

Transparency 4-24

(23) This compartment gives access to the hydraulic tank and filler cap.

Transparency 4-25

(24) There are two doors in front of the engine giving you access to (left/right) engine oil filters, engine oil dipstick and filler tube, transmission oil filter, brake filter, air cleaner, fuel priming pump, and primary fuel filter.

Transparency 4-26

(25) The mast controls include the lift cylinder, the lift chains, and the hydraulic lines on the left and right side of mast.

Transparency 4-27

(26) The carriage includes the side shift cylinder, the side tilt cylinder (oscillator), and the carriage/forks.

Transparency 4-28

(27) There are two tilt cylinders located in front of the cab.

Transparency 4-29

(28) This shows the shipping link in its shipping position.

Transparency 4-30

(29) This shows two battery boxes (one on the left/one on the right) with two batteries per box.

Transparency 4-31

(30) This shows the inside of the cab and instrument panels.

Transparency 4-32

(31) This shows the five mast controls: Top row L/R: side shift, side tilt and lock/unlock lever. Bottom row L/R: raise/lower mast and tilt back/forward.

Transparency 4-33

(32) There are two heaters in the RTCH. The overhead (shown here) and the floor heater (not shown).

NOTE: Conduct a check-on-learning and summarize the learning activity.

Check-on-Learning

Q. How high can containers be stacked with the RTCH?
A. Two containers high.

Q. The RTCH will ford up to how many inches of water?
A. 60.

Q. What is the maximum lifting height, in inches, from the bottom of the container?
A. 118.

Q. What are the three sizes, in feet, of the tophandlers for the 50,000-pound RTCH?
A. 20, 35, and 40.

Q. How many hours of operating time do you have with a full tank of fuel?
A. Ten.

Q. How many heaters are in the RTCH?
A. Two.

Q. How many battery boxes are there on the RTCH?
A. Two.

b. Familiarization of Major Components.

Transparency 4-34

(1) Radiator.

- Provides engine coolant.
- Holds 28 gallons.

(2) Upper engine access panels.

- To panels on each side.
- Allows engine access for maintenance.

Transparency 4-35

(3) Hood.

- Two-piece unit.
- Removable for engine maintenance.

(4) Operator's cab.

- Rollover protective structure.
- Will withstand one rollover.

Transparency 4-36

(5) Tilt cylinders.

- Two cylinders for tilting.
- Tilts mast forward or backward.

(6) Mast.

- Moves to position the container.
- Will lift container 12 inches below ground level.
- Lifts to 118 inches high from bottom of container.
- Will stack containers two high.

Transparency 4-37

(7) Forks.

- Mounts and secures tophandlers.
- Two types of forks:
  - Tophandler forks.
  - Inverted forks.

(8) Wheels, axles, and final drive.

- Steers and propels vehicle.
- One tire and rim weighs 3,000 pounds and is 6 feet tall.
- Fording height is 5 feet.

Transparency 4-38

(9) Steering cylinder.

- One on each side.
- Acts as power steering.

(10) Hitch. Articulates for easy steering.

Transparency 4-39

(11) Hydraulic tank.

- Holds 78 gallons of hydraulic oil.
- Located on right side.

(12) Fuel tank.

- Holds 165 gallons of fuel.
- Located on left side.
- Normally 10 hours of operation.

Transparency 4-40

(13) Lower engine access panels. One on each side.

(14) Battery boxes.

- One on each side.
- One box holds two 24-volt batteries.

Transparency 4-41

(15) Counterweights.

- Provides stability for handling loads.
- Has a total of seven counterweights.

(16) Towing pintle is for towing vehicles.

Transparency 4-42

(17) Lift cylinder raises and lowers mast.

(18) Side shift cylinder.

- Shifts forks and tophandler left and right.
- Helps in aligning or stacking container.

Transparency 4-43

(19) Side tilt cylinder rotates forks and tophandler for loading and stacking.

(20) Container lock cylinders.

- Rotates locks to secure tophandler to container.
- One on 20-foot tophandler.
- Two on 35-foot and 40-foot tophandler.

Transparency 4-44

(21) Handles ISO designation 1A or 1C cargo containers or sealand containers.

(22) Twenty-foot tophandler.

- Is 230 inches long (from lock to lock).
- Weight is 3,800 pounds.
- Width is 95 1/2 inches without guide plates.

Transparency 4-45

(23) Thirty-five foot tophandler.

- Is 34 feet, 4 inches long (from lock to lock).
- Weight is 9,120 pounds.
- Width is 92 3/4 inches without guide plates.

(24) Forty-foot tophandler.

- Is 39 feet, 3 7/8 inches (from lock to lock).
- Weight is 9,930 pounds.
- Width is 92 3/4 inches without guide plates.

Transparency 4-46

(25) Operational weight.

- Without tophandler - 103,230 pounds.
- With 20-foot tophandler - 107,030 pounds.
- With 35-foot tophandler - 112,350 pounds.
- With 40-foot tophandler - 113,160 pounds.

(26) Maximum speed without load.

- Forward is 18.5 mph.
- Reverse is 19.4 mph.

NOTE: Conduct a check-on-learning and summarize the learning activity.

Check-on-Learning

Q. How many hours will a full tank of fuel last in the 50,000-pound RTCH?
A. 10.

Q. How many tilt cylinders are on the 50,000-pound RTCH?
A. Two.

Q. What is the coolant capacity, in gallons, of the radiator?
A. 28.

Q. What is the operational weight, in pounds, without tophandler?
A. 103,230.

Q. What are the two types of forks that fit with the 50,000-pound RTCH?
A. Tophandler and inverted.

c. Familiarization of Controls and Instruments.

NOTE: Have students turn to page 2-2 in TM and follow along.

Transparency 4-47

(1) Controls for the 50,000-pound RTCH.

Transparency 4-48

(2) Transmission range selector. This selector has three ranges (forward, reverse, and neutral) and four speeds (1 through 4).

(3) Column release knob. Releases column for operating.

(4) Column lock. Lock column in forward position.

(5) Parking brake control knob. Pull to apply and push to release.

Transparency 4-49

(6) Accelerator.

- Push to increase speed.
- Release to decrease speed.

(7) Horn switch. Is operated by pressing down with foot.

(8) Brake pedals.

- Left - Neutralizes the transmission and applies brake.
- Right - Applies brakes.

Transparency 4-50

(9) Mast controls. There are five mast controls.

- Side tilt (tilts container).
  - Pull to tilt clockwise.
  - Push to tilt counterclockwise.
- Side shift (shifts containers).
  - Pull to shift right.
  - Push to shift left.
- Lift (raises and lowers container).
  - Pull to raise.
  - Push to lower.
- Tilt (tilts mast forward and backward).
  - Pull to tilt up.
  - Push to tilt down.
- Container lock (locks container to tophandler).
  - Pull to lock.
  - Push to unlock.

Transparency 4-51

(10) Heater controls.

- Floor heater - adjust to control amount of heat (there are two heaters in cab).
- Heater temperature control.
- Fan speed control.
- Heat and defrost rotating vents.

(11) Dome light switch.

Transparency 4-52

(12) Operator's seat controls.

- Vertical (height) adjustments (up or down).
- Fore-aft adjustment (forward or backward).
- Seat cushion tilt adjustment.
- Damper control adjusts how much spring you want.

NOTE: Always wear the seat belt when operating vehicle.

Transparency 4-53

(13) Right hand instrument panel of the 50,000-pound RTCH.

- Water temperature gauge.
  - White - cold.
  - Green - normal.
  - Red - hot.
- Converter oil temperature gauge.
  - Green - normal.
  - Red - hot.
- Voltmeter.
  - Red (21 volts or lower).
  - Black and white (21 to 24 volts).
  - Black and green (24 to 26 volts).
  - Green (26 to 30 volts).
  - Red (30 volts or higher).
- Fuel pressure gauge.
  - Red - low.
  - Green - normal.
- Engine oil pressure gauge.
  - Red - low.
  - White - normal (low idle).
  - Green - normal (high idle).
- Start aid (ether). For extreme cold weather below 32 degrees.

- Alternator.
  - ON with panel test engine not running.
  - OFF with engine running.
- Panel light. Gives light for switches and fuses.
- Panel test. Tests for burned out bulbs.
- Power switch. This switch has three positions (on, off, and start).
- Fuses. Has four fuses on right hand panel.

Transparency 4-54

(14) Left hand instrument panel of the 50,000-pound RTCH.

- Fuel low indicator lamp.
  - ON when testing.
  - ON when fuel is 10 percent of tank capacity and engine is running.
- Fuel high indicator lamp.
  - ON when panel check is made.
  - ON only if enough fuel for 10 hours is in fuel tank with engine off.
  - OFF during normal operation.
- Low engine oil indicator lamp.
  - ON when testing.
  - ON when oil level is low, engine running.
  - OFF during normal operation.
- Low hydraulic oil indicator lamp.
  - ON when testing.
  - ON when hydraulic oil level in hydraulic tank is low and engine not running.
  - OFF during normal operation.
- Implement indicator lamp.
  - ON when testing and filter is plugged.
  - OFF during normal operation.

- Transmission oil filter lamp.
  - ON when testing and if transmission filter is plugged.
  - OFF during normal operation.
- Air cleaner indicator lamp.
  - ON when testing and when air filter is plugged.
  - OFF during normal operation.
- Pilot brake indicator lamp.
  - ON when testing and if brake oil filter is plugged.
  - OFF during normal operation.
- Supplementary steering indicator lamp on when testing panel lamps, engine running, and engine not running.
- No coolant flow indicator lamp.
  - ON when testing panel. Engine and horn will sound when coolant flow stops while engine is running.
  - OFF during normal operation.
- Low pressure brake lamp.
  - ON when testing panel.
  - ON and OFF when accumulator oil pressure is low.
- High temperature hydraulic oil lamp.
  - ON when testing panel and when hydraulic oil in tank is high with engine running.
  - OFF during normal operation.
- Park brake indicator lamp.
  - ON when testing and when park brake is engaged.
  - OFF during normal operation.
- Panel light gives light for fuses and switches for left hand panel.
- Fuses for lights and instrument panel has five fuses and a total of nine.
- Service meter.
  - Records service hours that the engine has been operated.
  - Shows operator when scheduled maintenance is due.

- Wiper washer.

- Light switches - five switches.

  - Floodlight.
  - Headlight.
  - Taillight.
  - Auxiliary floodlight.
  - Auxiliary switch.

Transparency 4-55

(15) Container lock indicator.

- Two ready-to-lock lights. Indicates that tophandler is ready to be locked on container.
- One lock light. Indicates that tophandler is locked to container.
- One lock light. Indicates that tophandler is unlocked from container.

NOTE: To test for burned out bulbs, press lenses inward.

Transparency 4-56

(16) Main disconnect switch.

- ON connects power to vehicle electrical system (clockwise).
- OFF removes all power to vehicle electrical systems (counterclockwise).

NOTE: Conduct a check-on-learning and summarize the learning activity.

Check-on-Learning

Q. How many transmission ranges are on the 50,000-pound RTCH?
A. Three.

Q. How many speeds are on the 50,000-pound RTCH?
A. Four.

Q. How many mast controls levers are on the 50,000-pound RTCH?
A. Five.

Q. How many heaters are in the cab of the 50,000-pound RTCH?
A. Two.

Q. How many fuses are on the 50,000-pound RTCH?
A. Nine.

Q. For what is the panel test switch used?
A. Burned out bulbs.

Q. What is the purpose of the hour meter?
A. Record service hours for scheduled maintenance.

Q. How many light switches are on the 50,000-pound RTCH?
A. Five.

Q. How do you test the container lock indicator light?
A. Test by pressing lenses.

Q. When is the start aid used?
A. In extreme cold weather below 32 degrees.

3. **PRACTICAL EXERCISE.** This task shows 1 hour for practical exercise.

4. **EVALUATE.** Students are evaluated by a check on learning.

5. **SUMMARY.** Show Transparency 4-57.

    a. Recap main points.

    b. Allow for questions.

    c. Clarify questions.

    d. Give closing statement.

6. **RETRAINING.** Retrain and retest NO-GOs after normal duty hours.

E. SAFETY RESTRICTIONS. None.

F. ENVIRONMENTAL CONSIDERATIONS. None.

G. ADDITIONAL COMMENTS AND INFORMATION. Recommended instructional time is 3.0 hours (2.0 hours for conference and 1.0 hour for practical exercise).

LESSON TITLE: **SAFETY PROCEDURES**

TASK NUMBER: **551-726-1507 (Communicate With Hand and Arm Signals When Operating Rough-Terrain Container Handler)**

A. TRAINING OBJECTIVE.

TASK: Identify all hand and arm signals used when operating the 50,000-pound Rough-Terrain Container Handler.
NOTE: Show Transparency 4-58 (Objective).

CONDITION: Given check-on-learning questions with class notes.

STANDARD: To receive a "GO" for this lesson unit, the student will correctly answer all the check-on-learning questions.

B. INTERMEDIATE TRAINING.

Intermediate Training Objective 1

TASK: After this lesson unit, the student will learn safety procedures.

CONDITION: Given check-on-learning questions and class notes.

STANDARD: To receive a "GO" for this lesson unit, the student will correctly answer all the check-on-learning questions.

Intermediate Training Objective 2

TASK: After this lesson unit, the student will be able to identify safety precaution/warning and caution signs and hand/arm signals.

CONDITION: Given student handout 453-103 and check-on-learning questions.

STANDARD: To receive a "GO" for this lesson unit, the student will correctly answer all the check-on-learning questions.

C. ADMINISTRATIVE INSTRUCTIONS.

1. Training time: As scheduled.
2. Training location: Scheduled classroom with chairs and a power source.
3. Training type: Conference and practical exercise.
4. Students: Scheduled personnel.

5. Principal and assistant instructors required: One primary instructor for the class.

6. Training aids and equipment: Overhead projector; TM 10-3930-641-10, Instructor's Guide, Lesson Plan (TSP) and transparencies (for the instructor) and STP 55-88H1-SM, paper, and pen/pencil (for the student).

7. References: STP 55-88H1-SM and TM 10-3930-641-10.

NOTE: Before class arrival, ensure that each student desk or table has a TM 10-3930-641-10 and STP 55-88H1-SM.

D. SEQUENCE OF ACTIVITY.

1. **INTRODUCTION.**

a. Interest device.

b. Tie-in.

c. Lesson Objective (paragraph A).

d. Procedures.

(1) Explanation.

(2) Practical exercise.

(3) Summary.

2. **EXPLANATION AND DEMONSTRATION.** Discuss safety precautions and operations when working around the RTCH and demonstrate how to communicate with hand and arm signals.

a. Familiarization of Safety Procedures.

Transparency 4-59

(1) Safety precautions and operations.

Transparency 4-60

(2) Vehicle is not made for assistant operator (such as, riding on catwalk).

- Stay out of pivot area when the RTCH is turning or running.
- Travel at a safe speed (for example, do not follow vehicle too closely).

Transparency 4-61

(3) Never coast because hydraulic pressure drops and steering becomes difficult. Load must be carried 18 to 22 inches from the ground.

Transparency 4-62

(4) The vehicle is 14 feet from the ground to top of the mast. Always be aware of electric wires and overhangs.

Transparency 4-63

(5) The weight of the RTCH with a 40-foot tophandler weighs 113,000 pounds. Always stay a safe distance from cliffs, deep excavations, or dangerous areas (such as soft sand and washed out roads).

Transparency 4-64

(6) Never operate the RTCH, more than 15 degrees, on a side slope.

Transparency 4-65

(7) Never operate the RTCH, more than 15 percent, on a downhill grade.

Transparency 4-66

(8) Always stop engine and lower mast before leaving the RTCH. Mast will lower with engine off.

Transparency 4-67

(9) Always know the size of the area in which you have to operate.

Transparency 4-68

(10) Never smoke around vehicles.

Transparency 4-69

(11) Release the radiator cap slowly when checking coolant.

Transparency 4-70

(12) Release hydraulic pressure before doing any work on the hydraulic system. Remove cap slowly to release pressure.

Transparency 4-71

(13) Install shipping link when working in pivot area or during shipment.

Transparency 4-72

(14) Make sure all safety guards and covers are in place before operating.

Transparency 4-73

(15) Ensure that the rollover protective structure is not damaged. A damaged rollover protective structure will not protect you during a rollover.

Transparency 4-74

(16) Never wear loose clothing or jewelry while operating vehicle.

Transparency 4-75

(17) Always wear hearing protection while operating or within 50 feet of the RTCH.

Transparency 4-76

(18) Keep all personnel clear of work site.

Transparency 4-77

(19) Be familiar with hazards in your work site.

Transparency 4-78

(20) Place transmission in neutral and apply the parking brake before stopping or starting engine.

Transparency 4-79

(21) Always test mast controls before beginning operations.

Transparency 4-80

(22) Never move vehicle without proper brake oil pressure.

Transparency 4-81

(23) Always wear seat belts.

Transparency 4-82

(24) Keep vehicle clean of grease, fuel, and oily rags. Place trash in driver's compartment.

Transparency 4-83

(25) WARNING! Carbon monoxide (exhaust fumes) can kill you. Therefore, always operate the vehicle with a window open.

NOTE: Conduct a check-on-learning and summarize the learning activity.

Check-on-Learning

Q. What is the height, in feet, of the vehicle from the ground to the top of the mast?
A. 14.

Q. What is the weight, in pounds, of the vehicle with a 40-foot tophandler?
A. 113,000.

Q. What is the maximum side slope, in degrees, that a vehicle can operate?
A. 15

Q. Who is authorized to ride on the 50,000-pound RTCH?
A. No one.

Q. How high, in inches, should you carry the load?
A. 15 to 22.

Q. What is the percentage of the maximum downhill grade that a RTCH can operate?
A. 15.

Q. When do you install the shipping link?
A. When working in the pivot area and during shipment.

b. Familiarization of Safety Precaution/Warning and Caution Signs and Hand/Arm Signals.

Transparency 4-84

(1) Safety precautions.

Transparency 4-85

- Wear hard hats, ear plugs, safety boots, and work gloves at all times.
- Do not jump from or off of machine.
- Never walk between the RTCH and container.
- Always operate vehicle with lights on.
- Sound horn twice and look over both shoulders before shifting to reverse.

Transparency 4-86

- Ground guides should always stand where operator can see them at all times.
- Always keep a safe distance between vehicles (at least two vehicles apart).
- No horse playing or running in motor pool or training area.
- Never stand under forks or on tophandler (except during PMCS).
- Never stand behind the machine while engine is running.

NOTE: Refer to Student Handout 453-103.

Transparency 4-87

(2) Warning and caution signs.

Transparencies 4-88 through 4-92

- ROPS canopy warning sign. Located above door on left side.
- Hearing protection sign. Located on right-hand side of dash.
- Hand warning sign. Located on rear center mast.
- Standing on or under forks sign. Located on each side of fork assembly.
- No clearance for turning vehicle sign. Located at frame articulation on each side of the vehicle.

Transparency 4-93

(3) Hand and arm signals.

Transparencies 4-94 through 4-101

- Stop or discard last command. Right arm above head with forearm bent at elbow with fist clenched.
- Slow down. Right arm to waist level and wave arm in a sweeping motion from right to left several times.
- Lower load. Arm bent at elbow, forearm lowered, and point forefinger downward.
- Lift load. Raise right arm above head with arm bent at elbow, with forefinger upward.
- Tilt load forward. Arm bent at elbow, forearm lowered, and point forefinger and middle finger downward.
- Tilt load back. Raise right arm above head with arm bent at elbow with forefinger and middle finger upward.
- Tilt load to side. With hands on hips, tilt body in direction the load should tilt.

NOTE: Give demonstration of the following.

- Side shift load. Both arms bent at elbow, extend either hand with finger pointing the way the load should be shifted.

NOTE: Instructor demonstrates/instructs the following hand/arm signals.

- Turn the steering wheel.
    - Direction of extended arm indicates the turning direction.
    - May be used for either direction.
    - May be used while vehicle is moving or at a halt.

- Move forward or backwards.

  - Direction of palm indicates the direction of desired movement.
  - Be sure that the way is clear before backing up.

Transparency 4-102

(4) Nighttime hand and arm signals.

Transparency 4-103

- Lift load. Raise one light above head with light pointing upward.

Transparency 4-104

- Lower load. One light pointing toward the ground.

Transparency 4-105

- Tilt load forward. Two lights in a vertical position toward the ground.

Transparency 4-106

- Tilt load backward. Two lights in a vertical position above the head.

Transparency 4-107

- Side shift the load. With arm extended across chest pointing light in the direction the load will shift.

Transparency 4-108

- Oscillate the load. Ground guide tilts arm in the direction the load should tilt with the lower arm being in the direction the load should go.

Transparency 4-109

- Moving forward. Light in the upward position bring arms down to a horizontal position and return to a vertical position.

Transparency 4-110

- Moving backward. Two lights in a downward position and raising arms in an upward position.

Transparency 4-111

- Shutdown. Light positioned horizontally across throat and using back and forth motion.

Transparency 4-112

- Left turn. Extend left arm horizontally in the direction of movement.

Transparency 4-113

- Right turn. Extend right arm horizontally in the direction of movement.

Transparency 4-114

- Lock load. Raise flashlights above head making a slow circular motion with the light.

Transparency 4-115

- Unlock load. Point flashlight toward the ground making a slow circular motion with the light.

Transparency 4-116

- Stop. Raise lights above head and then cross lights to form a cross or X.

Transparency 4-117

- Slow down. Lower light to waist level and wave in a sweeping motion from right to left across body and turn several times.

NOTE: Conduct a check-on-learning and summarize the learning activity.

Check-on-Learning

Q. What should you do before shifting into reverse?
A. Sound horn twice and look over both shoulders.

Q. When can you stand under the forks or on tophandler?
A. During PMCS only.

Q. How many vehicles apart should you be when following another RTCH?
A. At least two vehicles.

Q. Where is the sign "no clearance when turning" located?
A. Where machine articulates.

Q. Where is the sign "hearing protection required" located?
A. On right hand side of dash.

Q. Where is the sign "no standing under forks" located?
A. On each side of mast.

Q. What is the correct hand signal for lifting the load?
A. Raise right arm above head with arm bent at elbow with forefinger pointing upward.

Q. What is the correct hand signal for tilting the load to the side?
A. With hands on hips, tilt body in direction the load should tilt.

Q. What is the correct hand signal, at night, for lowering the load?
A. One light pointing downward toward the ground.

Q. What is the correct hand signal, at night, for shutdown?
A. Light positioned horizontally across throat and using back and forth motion.

3. **PRACTICAL EXERCISE.** This task shows 4 hours for practical exercise.

4. **EVALUATE.** Students are evaluated by a check on learning.

5. **SUMMARY.** Show Transparency 4-118.

    a. Recap main points.

    b. Allow for questions.

    c. Clarify questions.

    d. Give closing statement.

6. **RETRAINING.** Retrain and retest NO-GOs after normal duty hours.

E. SAFETY RESTRICTIONS. None.

F. ENVIRONMENTAL CONSIDERATIONS. None.

G. ADDITIONAL COMMENTS AND INFORMATION. Recommended instructional time is 6.0 hours (2.0 hours for conference and 4.0 hours for practical exercise).

LESSON TITLE: **PREVENTIVE MAINTENANCE CHECKS AND SERVICES ON THE 50,000-POUND RTCH**

TASK NUMBER: **551-726-1505 (Preventive Maintenance Checks and Services on the 50,000-pound Rough-Terrain Container Handler)**

A. TRAINING OBJECTIVE.

TASK: Know the procedures for operator's preventive maintenance and conduct pre-operational checks and make operator entries on DA Form 2404.
NOTE: Show Transparency 4-119 (Objective).

CONDITION: Given a written situation, a blank DA Form 2404, and TM 10-3930-641-10.

STANDARD: To receive a "GO" for this lesson unit, the student will properly fill out all operator's entries on DA Form 2404.

B. INTERMEDIATE TRAINING.

Intermediate Training Objective 1

TASK: After this lesson unit, the student will be able to complete DA Form 2404 and record deficiencies.

CONDITION: Given a written situation, a blank DA Form 2404, and TM 10-3930-641-10.

STANDARD: To receive a "GO" for this lesson unit, the student will properly fill out all operator entries on DA Form 2404.

Intermediate Training Objective 2

TASK: After this lesson unit, the student will answer questions about the lubrication order (LO 10-3930-641-12) for the 50,000-pound RTCH.

CONDITION: Given check-on-learning questions and a lubrication order.

STANDARD: To receive a "GO" for this lesson unit, the student will correctly answer all the check-on-learning questions.

C. ADMINISTRATIVE INSTRUCTIONS.

1. Training time: As scheduled.

2. Training location: Scheduled classroom.

3. Training type: Conference and practical exercise.

4. Students: Scheduled personnel.

5. Principal and assistant instructors required: One primary instructor is required for the class.

6. Training aids and equipment: Overhead projector, projection screen, transparencies, DA Form 2404, and TM 10-3930-641-10 (1 per student).

7. References: DA Pamphlet 738-750 and TM 10-3930-641-10.

NOTE: Before class arrival, ensure that each student desk or table has a TM 10-3930-641-10, a LO 10-3930-641-12, and a blank DA Form 2404.

D. SEQUENCE OF ACTIVITY.

1. **INTRODUCTION.**

   a. Interest device.

   b. Tie-in.

   c. Lesson Objective (paragraph A).

   d. Procedures.

      (1) Explanation.

      (2) Summary.

2. **EXPLANATION AND DEMONSTRATION.** Properly fill out DA Form 2404.

a. Completing DA Form 2404.

Transparency 4-120

(1) DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

- Purpose of the form is to report faults on equipment that cannot be corrected by the operator.
- Preparing of DA Form 2404.

NOTE: The sample DA Form 2404 is for training purposes only.

Transparency 4-121

(2) Top part of DA Form 2404.

- Block 1, Organization - 368th Transportation Company.
- Block 2, Nomenclature and model - 50,000-pound truck RTCH.
- Block 3, Registration/Serial/NSN - 7600075.
- Block 4a, Miles - leave blank.
- Block 4b, Hours - shows hours on meter.
- Block 4c, Rounds fired - leave blank.
- Block 4d, Hot starts - leave blank.
- Block 5, Date - today's date.
- Block 6, Type inspection - indicate whether daily, weekly, or monthly.
- Block 7, Applicable reference.
  - TM number - 10-3930-641-10.
  - TM date - May 81.
  - TM number - If appropriate.
  - TM date - If appropriate.
- Block 8a, Signature.
  - Print last name, first, and rank.
  - Payroll signature.
- Block 8b, Time - Time finished inspection.
- Block 9a, 9b, and block 10 - Only use when required by local instructions.

Transparency 4-122

(3) Bottom part of DA Form 2404.

- Block a, TM item number - The number that the TM gives that item.
- Block b, Status - Enter the status symbol that applies to the fault.

NOTE: During this training, you will not use the status symbol.

- Block c, Deficiencies and shortcomings. A brief description of the fault. You may skip up to three lines between faults.
- Block d, Corrective action. Action taken to correct or take care of the fault.
- Block e, Initial when corrected. Insert initials when deficiencies are corrected. Leave blank if deficiencies have not been corrected.

NOTE: Have students turn to page 2-17, item 1-5, in TM 10-3930-641-10.

b. Preventive Maintenance Checks and Services Letters. There are five columns in the PMCS list**.**

- B is the before operations check.
- D is the during operations check.
- A is the after operations checks.
- W is the weekly checks.
- M is the monthly checks.

NOTE: Turn to page 2-19 in TM 10-3930-641-10.

Transparency 4-123

c. Leakage Definitions for PMCS.

- Class I leak. Seepage of fluid (as indicated by wetness or discoloration) and not great enough to form a drop.
- Class II leak. Leakage of fluid great enough to form a drop but not enough to cause drops to fall from item being checked/inspected.
- Class III leaks.

  ■ Leakage of fluid great enough to form a drop that falls from the item being checked/inspected.
  ■ Equipment operation is allowable with class I or class II leaks. However, a class III leak is unacceptable.

NOTE: Conduct a check-on-learning on the following situation.

SITUATION: You are the operator of a RTCH 67Y0075 during JLOTS operations. The RTCH has 343.3 hours on the meter. You are going to do a before operations check on the RTCH. You have done a walk around check and found a coolant leak coming from the lower radiator hose, the seat belt is frayed almost to the breaking point, the right rear tire has a 2-inch cut on the side wall, and the engine oil is low.

Check-on-Learning

Q. What would be entered in block 3 of DA Form 2404?
A. 67Y005.

Q. What would be entered in block 4b of DA Form 2404?
A. 343.3.

Q. What do you find in item 1?
A. Coolant leak from lower radiator hose.

Q. What do you find in item 14?
A. Seat belt badly frayed.

Q. What do you find in item 2?
A. Right rear tire has a 2-inch cut on side wall.

Q. What do you find in item 7?
A. Engine oil level low.

NOTE: Turn to page 2-20 in TM 10-3930-641-10.

Transparency 4-124

d. Before Operation Checks on the 50,000-pound RTCH.

Transparency 4-125

- Item 1. Walk around and check for the following:
  - Leaks on or under the vehicle.
  - Loose wires and damaged lines and hoses.
  - Loose or damaged parts.
- Item 2. Tires.
  - Check for cuts, abrasions, missing valve caps, and general condition.
  - Visually check for low air pressure on tires.
- Item 3. Exterior of machine.
  - Check for damage to fenders, mirrors, ladders, engine covers, and guards.
  - Check for missing or damaged parts on tophandler hydraulic cylinders, twisted locks, container lock cylinders, forks, carriage, lift chains, and mast cylinders.

Transparency 4-126

- Item 4. Hydraulic steering.
  - Check cylinders and hoses for obvious damage.
  - Check linkage for missing or damaged parts.
- Item 5. Fuel tank. If low fuel indicator comes on, notify organizational maintenance.
- Item 7: Engine (not running).
  - Check engine oil level.
  - Check all visible oil lines for leaks and damage.
- Item 9: Engine pre-cleaner/air cleaner. Check for clogging or debris.
- Item 12: Hydraulic tank. Check hydraulic level at sight gauge.

Transparency 4-127

- Item 13: Rollover protective structure. Check for damage and looseness.
- Item 14: Operator's cab. Check seat belt for wear, damage, or loose mounting.
- Item 17: Steering column lock.
  - Adjust wheel and column position.
  - Release the lock button.

Transparency 4-128

e. During Operation Checks on the 50,000-pound RTCH.

Transparency 4-129

- Item 3: Exterior of machine. Check condition of the following:
  - Windshield and windows.
  - Windshield wiper and blades.
- Item 5: Fuel tank. If low fuel indicator comes on, notify organizational maintenance.

- Item 14: Operator's cab.
  - Lights and gauges.
  - Container lights.
  - Low fuel indicator.
  - Check heater and defroster.
- Item 15: Light system.
  - Check operation of all lights.
  - Check lenses for damage.

Transparency 4-130

- Item 16: Parking brake.
  - Pull out to engage; parking brake indicator light comes on.
  - Push in to disengage; parking brake light goes out.

NOTE: Light will come on and horn will sound if brake is on with transmission engaged.

NOTE: Before starting engine, move gear selection to neutral, engage parking brake, and lock steering column.

- Item 18: Indicator lights. Start engine, check to ensure the following lights are off.
  - Low engine oil indicator.
  - Low hydraulic oil indicator.
  - No coolant flow indicator.
  - Implement filter indicator.
  - Transmission filter indicator.
  - Air filter indicator.
  - Pilot filter indicator.
  - High temperature hydraulic oil indicator.
  - Low pressure brake indicator.
  - Supplemental steering indicator.

Transparencies 4-131 and 4-132

- Item 19: Gauges (Indicators).
  - Engine oil pressure. Needle should be in green range within 10 seconds after engine starts.
  - Fuel pressure:
    - Green range - normal operation.
    - Red - stop machine.

- Water temperature:

  - Green range - normal operation.
  - Red - stop machine and investigate problem.

- Converter oil temperature:

  - Green range - normal operation.
  - Red - stop machine and check transmission oil level.

- Volts:

  - Green range - normal operation.
  - Charge or battery range:

    -- Stop engine.
    -- Inspect charging system.

- Item 20: Transmission.

  - Check oil level with engine warm.
  - Engine running, low idle.
  - Between low and full mark on dipstick.

- Item 21: Control levers.

  - Lift control.
  - Tilt control.
  - Side tilt control.
  - Container lock lever.

    - Unlock - push lever forward.
    - Lock - pull lever back.

Transparency 4-133

- Item 22: Service brakes.

  - If low-pressure brake light comes on within five pedal applications, the accumulator requires service.
  - In a clear area, apply service brake and shift transmission in second gear forward, machine must not move.
  - If machine moves, notify first line supervisor.

- Item 23: Transmission range selector.

  - Operate vehicle.
  - Use all four speeds.

NOTE: Stop vehicle before shifting from forward to reverse.

Transparency 4-134

f. After Operation Checks on the 50,000-pound RTCH.

- Item 5: Fuel tank. Have fuel tank filled at end of work day.

NOTE: Conduct a check-on-learning and summarize the learning activity.

Check-on-Learning

Q. What does TM item number 16 check?
A. Parking brake.

Q. What does TM item number 20 check?
A. Transmission.

Q. The control levers are checked by which TM item number?
A. 21.

Q. Service brakes are checked by which TM item number?
A. 22.

Q. TM item number 5 tells the operator to do what during after operation PMCS?
A. Have fuel tank filled.

g. Lubrication of the 50,000-pound RTCH.

NOTE: Turn to page 1-11 in LO 10-3930-641-12.

Transparency 4-135

- Lubrication points on the 50,000-pound RTCH.

Transparency 4-136

- Drive shaft support bearing - 1 lube point.
- Drive shaft spline - 1 lube point.
- Front drive shaft universal joint and spline - 2 lube points.
- Center drive universal joints - 2 lube points.
- Rear drive shaft universal joints - 2 lube points.
- Transmission drive shaft universal joint - 2 lube points.

Transparency 4-137

- Fan drive and belt tightener pulley lube point - 2 lube points.
- Front and rear steering cylinder bearings - 3 lube points.
- Rear axle trunnion and left rear steering cylinder bearing - 3 lube points.
- Upper and lower steering points - 2 lube points.

Transparency 4-138

- Tophandler twist locks, guide rods, and operating bearings.

  - Four lube points on twist locks.
  - Guide rods.
  - Operating shaft bearings.

    -- Two lube points on 20-foot tophandler.
    -- Six lube points on 35-foot and 40-foot tophandler.

- Tilt cylinders - 4 lube points.
- Mast mounting hinges - 2 lube points.
- Mast rollers - 4 lube points.
- Carriage rollers - 4 lube points.

h. Cleaning Solvent. The type of cleaning solvent for this machine is SD-2 solvent.

Check-on-Learning

Q. How many lube points are there on the drive shaft support bearing?
A. One.

Q. How many lube points are there on the transmission drive shaft universal?
A. Two.

Q. How many lube points are there on the tilt cylinders?
A. Four.

Q. How many lube points are on the center drive universal joint?
A. Two.

Q. What type of solvent is used to clean lube points?
A. SD-2.

3. **PRACTICAL EXERCISE.** This task shows 4 hours of practical exercise.

4. **EVALUATE.** Students are evaluated by a check on learning.

5. **SUMMARY.** Show Transparency 4-139.

    a. Recap main points.

    b. Allow for questions.

    c. Clarify questions.

    d. Give closing statement.

6. **RETRAINING.** Retrain and retest NO-GOs after normal duty hours.

E. SAFETY RESTRICTIONS. None.

F. ENVIRONMENTAL CONSIDERATIONS. None.

G. ADDITIONAL COMMENTS AND INFORMATION. Recommended instructional time is 7.0 hours (2.0 hours for conference, 1.0 hour for discussion, and 4.0 hours of practical exercise.).

LESSON TITLE: **STARTING/STOPPING/OPERATING ENGINE PROCEDURES**

TASK NUMBER: **551-726-1514 (Perform After-Operation Shutdown Procedures on the 50,000-pound RTCH)**

A. TRAINING OBJECTIVE.

TASK: As a forklift operator, you will need to know how to correctly start, drive, park, and stop the 50,000-pound RTCH. RTCH operation also includes performing PMCS before starting the RTCH.
NOTE: Show Transparency 4-140 (Objective).

CONDITION: Given check-on-learning questions and class notes.

STANDARD: To receive a "GO" for this lesson unit, the student will be familiar with the correct starting/stopping/operating engine procedures of the 50,000-pound RTCH.

B. INTERMEDIATE TRAINING.

Intermediate Training Objective 1

TASK: After this lesson unit, the student will learn how to start, drive, park, and stop the 50,000-pound RTCH.

CONDITION: Given TM 10-3930-641-10, check-on-learning questions, and class notes..

STANDARD: To receive a "GO" for this lesson unit, the student will be able to identify the correct procedures for starting, driving, parking, and stopping of the 50,000-pound RTCH.

C. ADMINISTRATIVE INSTRUCTIONS.

1. Training time: As scheduled.
2. Training location: Scheduled classroom with table, chairs, and a power source.
3. Training type: Conference and practical exercise.
4. Students: Scheduled personnel.
5. Principal and assistant instructors required: One primary instructor is required for the class.

6. Training aids and equipment: Overhead projector, projection screen, transparencies, 50,000-pound RTCH, and TM 10-3930-641-10 (1 per student).

7. References: TM 10-3930-641-10 and STP 55-88H1-SM.

NOTE: Before class arrival, ensure that each student desk or table has a TM 10-3930-641-10, STP 55-88H1-SM, paper, and pen/pencil.

D. SEQUENCE OF ACTIVITY.

1. **INTRODUCTION.**

a. Interest device.

b. Tie-in.

c. Lesson Objective (paragraph A).

d. Procedures.

(1) Explanation.

(2) Summary.

2. **EXPLANATION AND DEMONSTRATION.** Learn how to correctly start, drive, park, and stop the 50,000-pound RTCH.

Transparency 4-141

a. Before Starting Procedures.

Transparency 4-142

- Do all before operation preventive maintenance checks and services before starting vehicle.
- Turn main disconnect switch to the ON position. Never turn main disconnect switch OFF while engine is running.

Transparency 4-143

- Turn power switch to ON position.
- The following six indicator lights should be on (all others off):
  - High fuel.
  - No coolant flow.
  - Supplemental steering.
  - Low press brake.
  - Park brake.
  - Alternator.
- Panel test switch "Press Down." All indicator lights should come on. If indicator light does not come on, fuse or bulb may be blown.

Transparency 4-144

b. Starting Procedures.

Transparency 4-145

- Parking brake "ENGAGED."
- Steering column unlocked and lowered to desired position.
- Transmission range selector "NEUTRAL."
- Accelerator pedal. Press down 25 percent and hold.

Transparency 4-146

- Turn power switch to "START" position and release when engine starts. Also release accelerator pedal. If engine does not start after 30 seconds, let starter cool for 2 minutes, then try again.
- Engine runs at idle for 5 minutes. Do not engage hydraulic controls. Oil pressure gauge should read in green range.
- Engine oil level. Check for proper reading.

Transparency 4-147

- Transmission oil level. Check for proper reading.
- Right hand instrument panel. Check for proper reading.
- Left hand instrument panel. Check for proper reading.
- All lights off except fuel high and park brake indicators.

NOTE: Turn on all lights.

Transparency 4-148

c. Driving Procedures.

Transparency 4-149

- Controls - Check for proper operations.
- Right brake pedal - Press and hold.
- Parking brake - "PUSH" to release.

NOTE: Horn will sound if parking brake is engaged while machine is in gear.

Transparency 4-150

- Transmission range selector - Move to desired direction of travel.

NOTE: Rotate range selector to change gears for more speed.

- Right brake pedal - Release.
- Accelerator - "PRESS" to move vehicle.

NOTE: While operating vehicle, frequently check the instrument panel for proper functioning of lights and gauges.

Transparency 4-151

d. Parking Procedures.

Transparency 4-152

- Accelerator - "RELEASE."
- Right brake pedal - Press to stop vehicle.
- Transmission range selector - Move to neutral.
- Parking brake - "ENGAGED."
- Forks/Tophandler - Slowly move to lowest position.

NOTE: Turn off all lights.

Transparency 4-153

e. Stopping Engine Procedures.

Transparency 4-154

- Engine.
  - Operate at half speed for 5 minutes.
  - Operate at low idle for 30 seconds.

- Power Switch.
  - Turn off.
  - Remove key.
- Steering Column.
  - Hold steering wheel.
  - Pull out and hold COLUMN RELEASE lever.
  - Slowly move steering column as far forward as it will go.

Transparency 4-155

- Steering Column Lock.
  - Lock.
  - Remove steering column key.
- Main Disconnect.
  - Turn off.
  - Remove key when parking overnight or for long periods of time.
- Wheels. Block if parked on a slope.

NOTE: Conduct a check-on-learning and summarize the learning activity.

Check-on-Learning

Q. What is the first step in starting the 50,000-pound RTCH?
A. All before operations PMCS.

Q. During starting, if the engine does not start after 30 seconds, how many minutes should you let the starter cool?
A. 2.

Q. After starting, what two indicator lights should be on the left-hand instrument panel?
A. Fuel high and parking brake indicator.

Q. How far down should you press the accelerator when starting the 50,000-pound RTCH?
A. 25 percent.

Q. How many minutes do you let the engine idle at half speed during shutdown procedures?
A. 5.

3. **PRACTICAL EXERCISE.** This task shows 4 hours of practical exercise.

4. **EVALUATE.** Students are evaluated by exam 9G5-301-08.

5. **SUMMARY.** Show Transparency 4-156.

    a. Recap main points.

    b. Allow for questions.

    c. Clarify questions.

    d. Give closing statement.

6. **RETRAINING.** Retrain and retest NO-GOs after normal duty hours.

E. SAFETY RESTRICTIONS. None.

F. ENVIRONMENTAL CONSIDERATIONS. None.

G. ADDITIONAL COMMENTS AND INFORMATION. Recommended instructional time is 13.0 hours (1.0 hour for conference, 4.0 hours of practical exercise, and 8.0 hours for exam.).